

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



13 APR 2005

(43) International Publication Date  
6 May 2004 (06.05.2004)

PCT

(10) International Publication Number  
WO 2004/037149 A1

(51) International Patent Classification<sup>7</sup>: A61G 7/057,  
F16K 31/00, 15/14, 15/18, A47C 27/08, 27/10

(21) International Application Number:  
PCT/US2003/033240

(22) International Filing Date: 22 October 2003 (22.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/420,724 23 October 2002 (23.10.2002) US

(71) Applicant (for all designated States except US): TCAM  
TECHNOLOGIES, INC. [US/US]; 6944 Spinach Drive,  
Mentor, OH 44060 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): SCHNEIDER, Ed-  
ward, T. [US/US]; 216 East Island, Eastlake, OH 44094  
(US).

(74) Agent: KOCOVSKEY, Thomas, E., Jr.; Fay, Sharpe, Fa-  
gan, Minnich & McKee, LLP, Seventh Floor, 1100 Superior  
Avenue, Cleveland, OH 44114-2579 (US).

(81) Designated States (national): AH, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,  
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

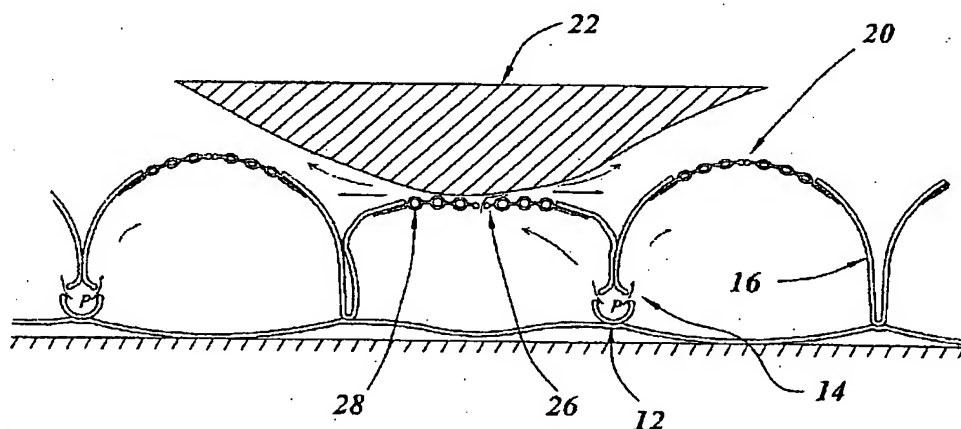
Published:

— with international search report

— before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

[Continued on next page]

(54) Title: SMART DECUBITUS MAT



(57) Abstract: A decubitus mat includes a plurality of individual cells (16) which are pressurized by air from an air supply (10) through air supply lines (12) and metering orifices (14). A polymer sensor/vent structure (20) is mounted on a top surface of each cell to be contacted by a body (22) resting on the mat. The sensor/vent structure defines a plurality of polymer-filled channels (28) and a vent valve (26) which is biased to a closed position. As the body heats the polymer, it undergoes a phase change and expands causing biasing forces (30) which bias the vent valve to open. When the vent valve opens, the air in the cell is released, providing an air flow to remove pooled moisture under the body. The vented cell collapses, transferring support to adjoining cells until it no longer contacts the body. Once removed from the body, the air flow in the cell cools the polymer, closing the vent, allowing the cell to re-pressurize. The polymer is selected such that the cells slightly over and under-deflate in each cycle, creating a massaging action.

WO 2004/037149 A1